CITY OF RIGBY (PWS 7260032)
SOURCE WATER ASSESSMENT FINAL REPORT

July 1, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *Source Water Assessment for the City of Rigby, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighted system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic compounds (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The City of Rigby drinking water system consists of three well sources. Well #1 has high susceptibility to microbial contaminants and moderate susceptibility to IOCs, SOCs, and VOCs. Well #2 has moderate susceptibility to all potential contaminant categories. Well #3 has high susceptibility to IOCs and has moderate susceptibility to VOCs, SOCs, and microbial contaminants. For Well #3, a detection of the IOC iron at a level above the maximum contaminant level (MCL) automatically gives a high susceptibility rating to IOCs. Because the delineation of Well #1 runs through the City of Rigby, the number of potential contaminant sources that can affect the water quality of Well #1 was greater. Therefore, more sources containing microbial contaminants within the Well #1 delineation contributed to Well #1's high microbial susceptibility.

Total coliform was detected in the distribution system in August 1995, December 1997, and again in January 1998. The IOCs fluoride, nitrate, zinc, and aluminum have been detected in Well #3, but at levels below the MCLs. Iron, another IOC, was detected in Well #3 in August 1996 at 0.38 milligrams per liter (mg/L), a level greater than the MCL of 0.30 mg/L. No VOCs or SOCs have been recorded in any of the wells during any water chemistry tests. Surrounding agricultural land use practices have contributed to the ratings of "High" for county-level nitrogen fertilizer use, county-level herbicide use, and total county-level Ag-chemical use. Additonally, the designated source water areas of the City of Rigby wells cross a priority area of the pesticides atrazine and alachlor.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the City of Rigby's drinking water wells, water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys (inspections conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity), including protection of the wells from surface flooding. Also, if microbial contamination becomes a problem, disinfection practices should be implemented. The City of Rigby may need to investigate various engineering solutions to lower the iron levels in Well #3. No chemicals should be stored or applied within the 50-foot radius of the wellheads. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zones. Since much of the designated protection areas are outside the direct jurisdiction of the City of Rigby, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors through the delineations, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE CITY OF RIGBY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the rankings of this assessment mean.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the City of Rigby is comprised of three ground water wells that serve approximately 3,047 people through 1,000 connections for community use. Well #1 and Well #2 are fire protection/backup wells and Well #3 serves as the main well for the City of Rigby. Situated in Jefferson County, the wells are located within the City of Rigby (Figure 1). Well #1 is located adjacent to City Hall in the center of the city. Well #2 and Well #3 are both located on the north side of Rigby. The current significant potential water problem affecting the water system of the City of Rigby pertains to the detection of iron at a level greater than the MCL. In 1996, the IOC iron was detected in Well #3 at 0.38 mg/L, a level greater than the current MCL of 0.30 mg/L.

Total coliform was detected in the distribution system in August 1995, December 1997, and again in January 1998. The IOCs fluoride, zinc, aluminum, and nitrate have been detected in the water system but at levels below the MCLs. No VOCs or SOCs have been recorded in any of the wells during any water chemistry tests. Surrounding agricultural land use practices have contributed to the ratings of “High” for county-level nitrogen fertilizer use, county-level herbicide use, and total county-level Ag-chemical use. Additionally, the delineated source water areas cross a priority area of the pesticides atrazine and alachlor.

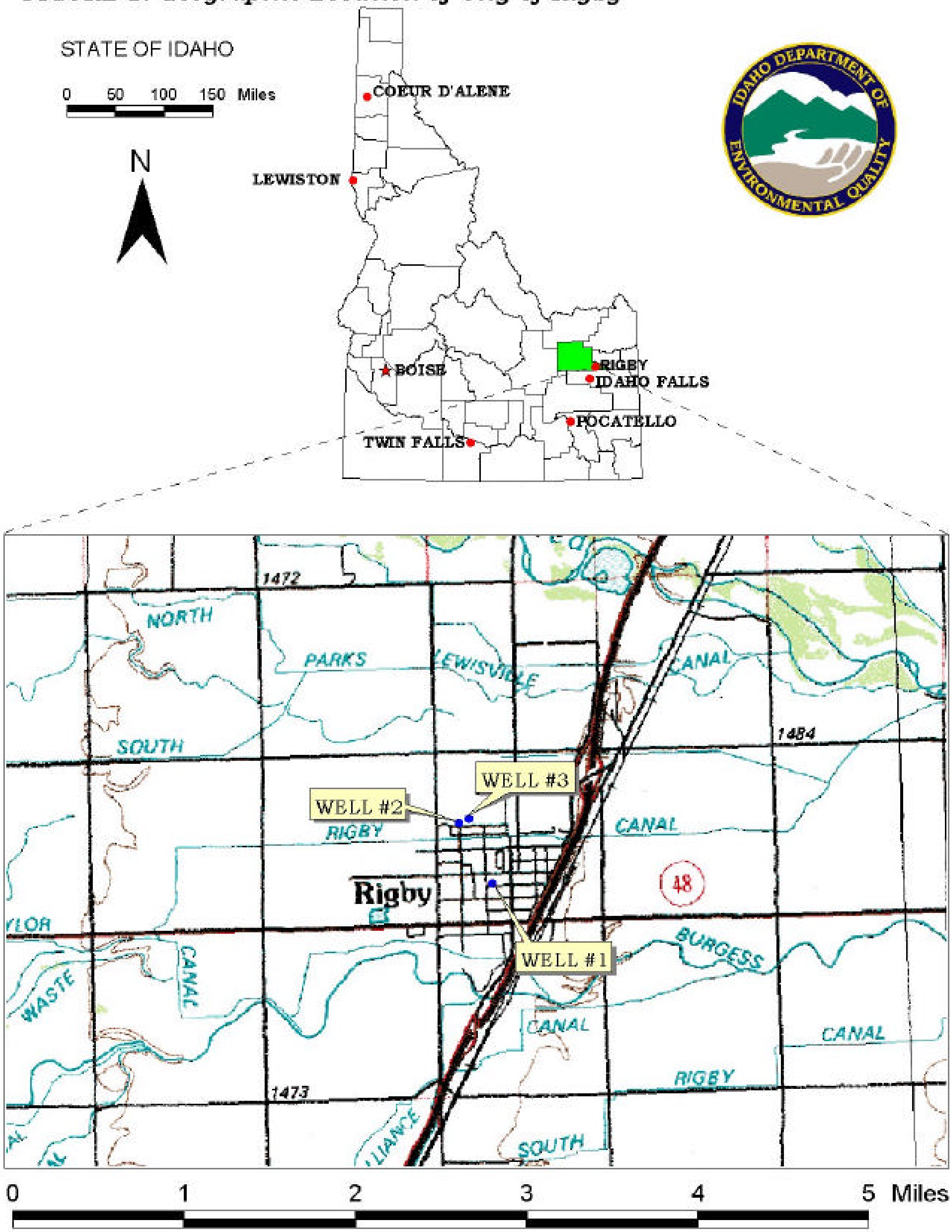
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the wells of the City of Rigby. The computer model used site specific data, assimilated by WGI from a variety of sources including the City of Rigby operator input, local area well logs, and hydrogeologic reports (detailed below).

The ESRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine (lake-deposited) sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bound on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. Other than the Big and Little Wood rivers, rivers entering from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

FIGURE 1. Geographic Location of City of Rigby



The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be locally confined in some areas because of inter-bedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Upper ESRP hydrologic province is located on the northeastern margin of the ESRP. The majority of the province is located above the confluence of the South and Henrys Forks of the Snake River in southwestern Madison County. The province occupies portions of Fremont, Madison, Jefferson, and Bonneville counties. The province covers 445 square miles, which is 4.3 percent of the ESRP's total area.

Published water table maps specific to the Upper ESRP regional aquifer are limited. The few area-specific maps that are available (e.g., Crosthwaite et al., 1967, p. 27, and Baker, 1991, p. 10) show similar patterns of flow to those depicted at the regional scale. Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment areas for the wells of the City of Rigby can best be described as pie-shaped northeastward-trending corridors approximately five and a half miles long, crossing Highway 20 and ending at the Snake River (Figures 2, 3, and 4 in Appendix A). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and others, such as cryptosporidium, and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of wells of the City of Rigby consists of residential and urban uses, while the surrounding area is predominantly irrigated agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in July through August 2001. The first phase involved identifying and documenting potential contaminant sources within the City of Rigby source water assessment areas (Figures 2, 3, and 4 in Appendix A) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the areas.

The delineated source water areas encompass pie-shaped corridors of land extending northeastward from the well sites and ending at the Snake River. Due to the location of the Snake River in the area, the delineations only include the 3-year TOT. All of the well delineations cross Highway 20 and the Union Pacific Railroad, major transportation corridors that can add leachable contaminants to the aquifer in the event of a spill or release. For the most part, all of the delineations include various businesses such as automobile repair shops, photography, and veterinarian offices, several underground storage tanks (USTs), site that are regulated under the Superfund Amendments and Reauthorization Act (SARA) and a dairy with up to 200 cows (Tables 1, 2, and 3 in Appendix A).

Section 3. Susceptibility Analyses

Each well’s susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. Each of these three categories carries the same weight in the final assessment, meaning that a low score in one category coupled with higher scores in the other categories can still lead to a overall susceptibility of high. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix B contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity rates moderate for all of the City of Rigby wells (Table 4). The soils surrounding the area of the wellheads are in the poor to moderate-draining soil class, reducing the downward movement of contaminants to the aquifer. Additionally, the well log for Well #3 indicates the presence of a 50-foot thick clay zone above the producing zone, further hindering the downward migration of contaminants. The well logs were unavailable for Well #1 and Well #2, preventing a determination of the depth to ground water, composition of the vadose zone, or the presence of low permeability layers.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

For the City of Rigby, Well #3 has a high system construction score and Well #1 and Well #2 have moderate system construction scores. A sanitary survey was not available for Well #3, preventing a determination of the maintenance of the wellhead and surface seals and the protection of the well from surface flooding. However, the 1995 sanitary survey included both Well #1 and Well #2. It indicated that the wellhead and surface seals of both wells were maintained and that the wells were properly protected from surface flooding.

The well log for Well #3 shows that the well was drilled in 1996 to a total depth of 715 feet below ground surface (bgs). The well was constructed using a 0.250-inch thick, 24-inch diameter casing installed to a depth of 20 feet bgs into “brown sand and large gravel”, a 0.375-inch thick, 20-inch casing from 20 feet bgs to 280 feet bgs into “sand-gravel and clay”, and a 0.375-inch thick, 16-inch diameter casing from 280 feet bgs to 623 feet bgs into “red and gray lava.” The annular seal was installed using bentonite to a depth of 20 feet bgs into “brown sand and large gravel” and the static water depth is at 49 feet bgs. The well is not screened.

The well logs for Well #1 and Well #2 were unavailable making it impossible to determine the depth to first ground water, the depth of the highest production interval, and the placement of the casing and annular seal. However, the 1995 sanitary survey did provide some information about the wells’ construction. Well #1 was constructed in 1978 as a fire/emergency backup well. Well #2 was drilled in 1991 to a depth of 487 feet bgs and is also now used as a backup well.

Though the wells may have been in compliance with standards when they were completed, current public water system (PWS) well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A 24-inch diameter well requires a casing thickness of at least 0.500-inches, a 20-inch diameter well requires a casing thickness of at least 0.375-inches and a 16-inch diameter well requires a casing thickness of at least 0.375-inches.

Potential Contaminant Source and Land Use

The three wells of the City of Rigby rate moderate for IOCs (i.e. nitrates arsenic), VOCs (i.e. petroleum products) and microbial contaminants (i.e. bacteria) and they rate high for SOCs (i.e. pesticides). The major transportation corridors (Highway 20 and Union Pacific Railroad) that extend across the delineations as well as the predominant agricultural land use in the delineated source water areas account for the largest contribution of points to the potential contaminant inventory rating. The pesticide priority areas within the delineations significantly contributed to the high SOC land use rating.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. A detection of iron above the MCL was recorded at Well #3 in 1996, giving a high susceptibility to IOCs for the well. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, all of the City of Rigby wells rate moderate for VOCs and SOCs. Well #1 rates high for microbials whereas Well #2 and Well #3 rate moderate for microbials. Well #3 rates high for IOCs whereas Well #1 and Well #2 rates moderate for IOCs.

Table 1. Summary of City of Rigby Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	M	M	H	M	M	M	M	M	H
Well #2	M	M	M	H	M	M	M	M	M	M
Well #3	M	M	M	H	M	H	H*	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
*** = Automatic high susceptibility score due to the detection of iron in Well #3 at a level above the MCL**

Susceptibility Summary

Overall, Well #1 rates high susceptibility to microbials and moderate susceptibility to IOCs, VOCs and SOCs. Well #2 rates moderate susceptibility to all potential contaminant categories. Well #3 rates an automatic high susceptibility to IOCs and rates moderate to VOCs, SOCs, and microbial contaminants. The high microbial rating of Well #1 can be attributed to the multiple sources within the Well #1 delineation that contained potential microbial contaminants. The high IOC score of Well #3 can be attributed to the detection of iron at levels above the MCL. The predominant agricultural land which influenced the “high” county-wide farm chemical use rating as well as the pesticide priority area added to the final susceptibility ratings of all of the wells.

Total coliform was detected in the distribution system in August 1995, December 1997, and again in January 1998. The IOCs fluoride, nitrate, zinc, and aluminum have been detected in Well #3, but at levels below the MCLs. Iron, another IOC, was detected in Well #3 in August 1996 at 0.38 mg/L, a level greater than the MCL of 0.30 mg/L. No VOCs or SOCs has been recorded in any of the wells during any water chemistry tests. Surrounding agricultural land use practices have contributed to the ratings of “High” for county-level nitrogen fertilizer use, county-level herbicide use, and total county-level Ag-chemical use. Additionally, the designated source water areas of the City of Rigby wells cross a priority area of the pesticides atrazine and alachlor.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the City of Rigby’s drinking water wells, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys, including protection of the wells from surface flooding. Also, if microbial contamination becomes a problem, disinfection practices should be implemented. The City of Rigby may need to investigate various engineering solutions to lower the iron levels in Well #3. No chemicals should be stored or applied within the 50-foot radius of the wellheads. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zones. Since much of the designated protection areas are outside the direct jurisdiction of the City of Rigby, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineations are near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are major transportation corridors through the delineations, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive source water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mharper@velocitus.net) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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Appendix A

City of Rigby
Potential Contaminant Inventories
Tables 2, 3, and 4

Source Water Delineations
Figures 2, 3, and 4

Table 2. Well #1 of the City of Rigby, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
1, 4	LUST – Site Cleanup Incomplete, Impact: Groundwater; UST – Open	0 – 3	Database Search	VOC, SOC
2	UST – Closed	0 – 3	Database Search	VOC, SOC
3	UST – Closed	0 – 3	Database Search	VOC, SOC
5	UST – Open	0 – 3	Database Search	VOC, SOC
6	UST – Closed	0 – 3	Database Search	VOC, SOC
7	UST – Closed	0 – 3	Database Search	VOC, SOC
8	UST – Open	0 – 3	Database Search	VOC, SOC
9	Dairy - <=200 cows	0 – 3	Database Search	IOC, Microbials
10	Floor Laying Refinishing & Resurfacing	0 – 3	Database Search	IOC, VOC, SOC
11	Cabinets – Manufacturers	0 – 3	Database Search	IOC, VOC, SOC
12	Laboratories – Dental	0 – 3	Database Search	IOC, VOC, SOC
13	Nurserymen	0 – 3	Database Search	IOC, SOC, Microbials
14, 22	Tire –Dealers – Retail	0 – 3	Database Search	IOC, VOC, SOC
15	Photographers – Portrait	0 – 3	Database Search	IOC, VOC
16	County Govt – Transportation Program	0 – 3	Database Search	IOC, VOC, SOC
17	Newspapers (Publishers)	0 – 3	Database Search	IOC, VOC
18, 19, 20, 25	Veterinarians	0 – 3	Database Search	IOC, Microbials
21	Laboratories – Dental	0 – 3	Database Search	IOC, VOC, SOC
23	Automobile Dealers – New Cars	0 – 3	Database Search	VOC, SOC
24	Home Improvements	0 – 3	Database Search	IOC, VOC, SOC
26	Automobile Body – Repairing and Painting	0 – 3	Database Search	IOC, VOC, SOC
27	RCRA site	0 – 3	Database Search	IOC, VOC, SOC
28	Mine – Gravel Pit	0 – 3	Database Search	IOC, VOC, SOC, Microbials
29	Mine – Gravel Pit	0 – 3	Database Search	IOC, VOC, SOC, Microbials
30	SARA site	O – 3	Database Search	IOC
31	SARA site	0 – 3	Database Search	IOC, VOC, SOC
	Highway 20	0 – 3	Database Search	IOC, VOC, SOC, Microbials
	Union Pacific Railroad	0 – 3	Database Search	IOC, VOC, SOC, Microbials

[1] LUST = leaking underground storage tanks, UST = underground storage tanks, RCRA = Resource Conservation and Recovery Act, SARA = Superfund Amendments and Reauthorization Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 3. Well #2 of the City of Rigby, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
1, 2, 19, 23, 24	LUST – Site Cleanup Incomplete, Impact: Groundwater; UST – Open; SARA	0 – 3	Database Search	IOC, VOC, SOC
3, 4, 15, 21	UST – Closed; UST – Open; Aerial Applicators; RCRA site	0 – 3	Database Search	IOC, VOC, SOC
5	UST – Closed	0 – 3	Database Search	VOC, SOC
6	UST – Closed	0 – 3	Database Search	VOC, SOC
7	Dairy = <=200 cows	0 – 3	Database Search	IOC, Microbials
8	Photographers – Portrait	0 – 3	Database Search	IOC, VOC
9	Welding	0 – 3	Database Search	IOC, VOC, SOC
10	Tractor – Dealers (Wholesale)	0 – 3	Database Search	VOC, SOC
11	Automobile Parts – Used & Rebuilt	0 – 3	Database Search	IOC, VOC, SOC
12	Roofing Contractors	0 – 3	Database Search	IOC, VOC, SOC
13	General Contractors	0 – 3	Database Search	IOC, VOC, SOC
14	Automobile Dealers – New Cars	0 – 3	Database Search	VOC, SOC
16	Home Improvements	0 – 3	Database Search	IOC, VOC, SOC
17	Plating (Manufacturers)	0 – 3	Database Search	IOC, VOC
18	General Contractors	0 – 3	Database Search	IOC, VOC, SOC
20	Automobile Machine Shop Service	0 – 3	Database Search	IOC, VOC, SOC
22	RCRA site	0 – 3	Database Search	IOC, VOC
	Highway 20	0 – 3	Database Search	IOC, VOC, SOC, Microbials
	Union Pacific Railroad	0 – 3	Database Search	IOC, VOC, SOC, Microbials

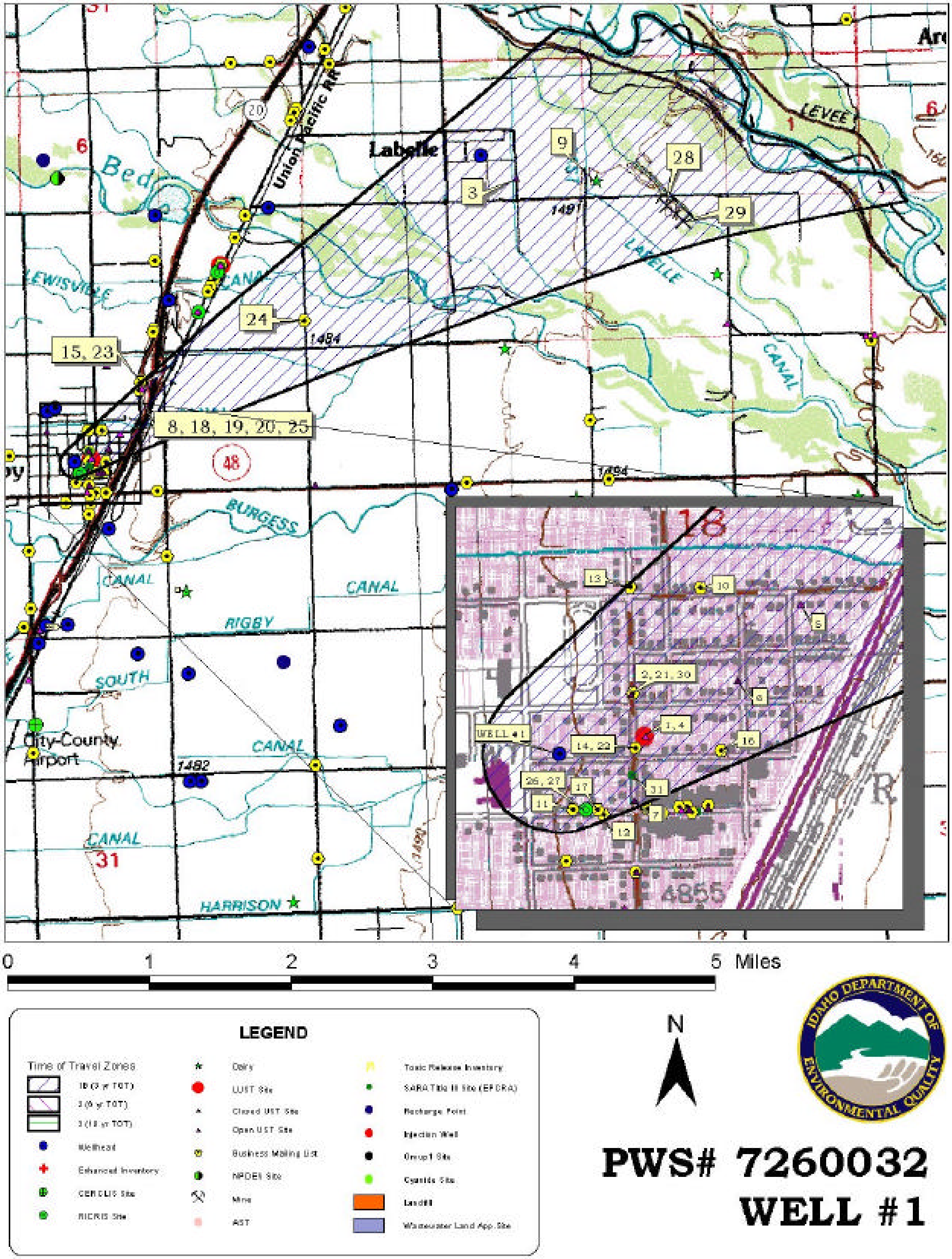
[1] LUST = leaking underground storage tanks, UST = underground storage tanks, RCRA = Resource Conservation and Recovery Act, SARA = Superfund Amendments and Reauthorization Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 4. Well #3 of the City of Rigby, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
1, 2, 18, 23, 24	LUST – Site Cleanup Incomplete, Impact: Groundwater; UST – Open; SARA site	0 – 3	Database Search	IOC, VOC, SOC
3, 4, 15, 20	UST – Closed; UST – Open; Aerial Applicators; RCRA site	0 – 3	Database Search	IOC, VOC, SOC
5	UST – Closed	0 – 3	Database Search	VOC, SOC
6	UST – Closed	0 – 3	Database Search	VOC, SOC
7	Dairy = <=200 cows	0 – 3	Database Search	IOC, Microbials
8	Photographers – Portrait	0 – 3	Database Search	IOC, VOC
9	Welding	0 – 3	Database Search	IOC, VOC, SOC
10	Tractor – Dealers (Wholesale)	0 – 3	Database Search	VOC, SOC
11	Automobile Parts – Used & Rebuilt	0 – 3	Database Search	IOC, VOC, SOC
12	Roofing Contractors	0 – 3	Database Search	IOC, VOC, SOC
13	General Contractors	0 – 3	Database Search	IOC, VOC, SOC
14	Automobile Dealers – New Cars	0 – 3	Database Search	VOC, SOC
16	Plating (Manufacturers)	0 – 3	Database Search	IOC, VOC
17	General Contractors	0 – 3	Database Search	IOC, VOC, SOC
19	Automobile Machine Shop Service	0 – 3	Database Search	IOC, VOC, SOC
21	RCRA site	0 – 3	Database Search	IOC, VOC
	Highway 20	0 – 3	Database Search	IOC, VOC, SOC, Microbials
	Union Pacific Railroad	0 – 3	Database Search	IOC, VOC, SOC, Microbials

[1] LUST = leaking underground storage tanks, UST = underground storage tanks, RCRA = Resource Conservation and Recovery Act, SARA = Superfund Amendments and Reauthorization Act
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

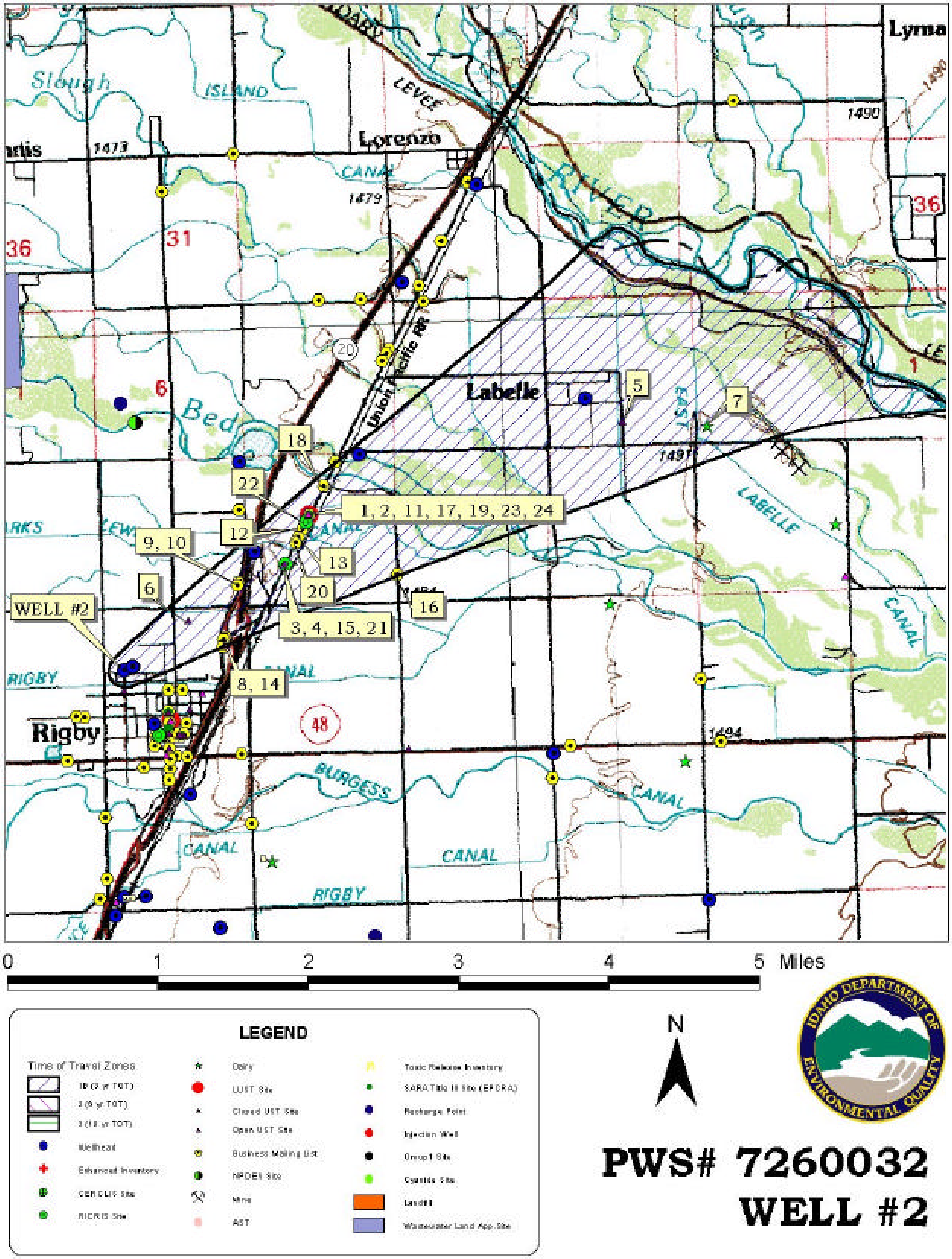
Figure 2. City of Rigby Delineation Map and Potential Contaminant Source Locations



PWS# 7260032

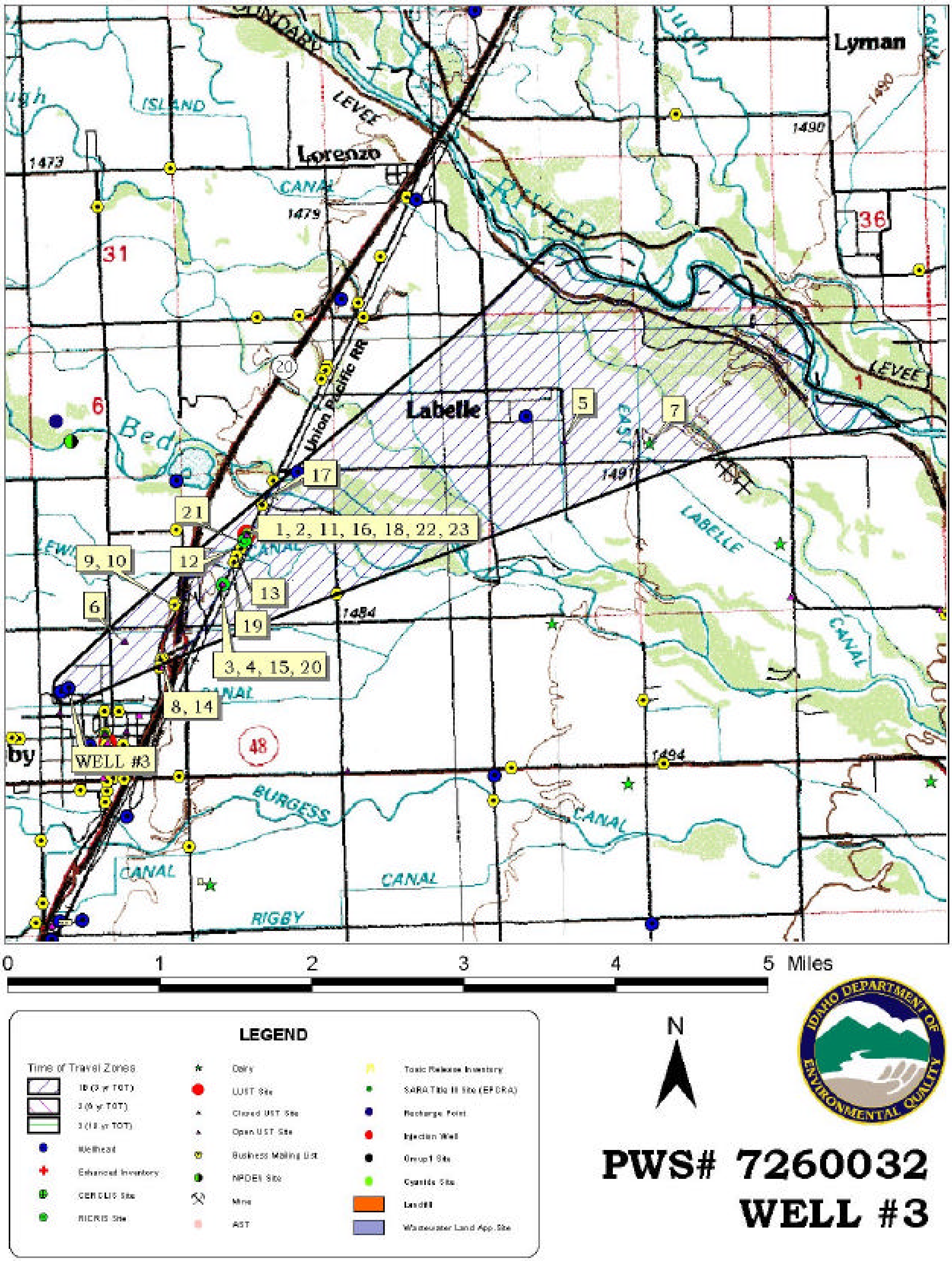
WELL #1

Figure 3. City of Rigby Delineation Map and Potential Contaminant Source Locations



PWS# 7260032
WELL #2

Figure 4. City of Rigby Delineation Map and Potential Contaminant Source Locations



Appendix B

City of Rigby
Susceptibility Analysis
Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name :
RIGBY CITY OF   Well# : WELL #1
Public Water System Number 7260032   12/14/2001 8:49:23 AM

1. System Construction		SCORE			
Drill Date	1/1/1978				
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	1995			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	YES	0			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
	Total Hydrologic Score	4			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	19	24	23	7
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	23	24	23	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
	Total Potential Contaminant Source / Land Use Score - Zone 1B	16	16	18	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II		0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	0	0	0	0
Cumulative Potential Contaminant / Land Use Score		20	18	22	14

4. Final Susceptibility Source Score		12	12	12	13
5. Final Well Ranking		Moderate	Moderate	Moderate	High

Ground Water Susceptibility Report   Public Water System Name : RIGBY CITY OF   Well# : WELL #2

Public Water System Number 7260032   12/14/2001 8:47:10 AM

1. System Construction		SCORE
Drill Date	1/1/1991	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1995
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	15	18	14	3
(Score = # Sources X 2) 8 Points Maximum		8	8	8	6
Sources of Class II or III leacheable contaminants or	YES	19	18	14	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	18	10
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	

Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		20	18	22	12
4. Final Susceptibility Source Score		12	12	12	12
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name :
RIGBY CITY OF Well# : WELL #3
Public Water System Number 7260032 12/14/2001 8:46:24 AM

1. System Construction		SCORE
Drill Date	7/30/1996	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1
Total System Construction Score		5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
Total Hydrologic Score		2

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	15	18	15	3
(Score = # Sources X 2) 8 Points Maximum		8	8	8	6
Sources of Class II or III leacheable contaminants or	YES	19	18	15	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	18	10
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	

Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		20	18	22	12
4. Final Susceptibility Source Score		11	11	11	11
5. Final Well Ranking		High	Moderate	Moderate	Moderate